

REMARKS

This is intended as a full and complete response to the Office Action dated October 14, 2003, having a shortened statutory period for response set to expire on January 14, 2004. Claims 1-21 were pending in the application prior to this response. Claims 1-21 have been cancelled by Applicant without prejudice. Claims 22-38 are submitted for consideration by the Examiner. Withdrawal of the rejections is requested for reasons presented below.

Claims 11-21 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point and distinctly claim the subject matter which applicant regards as the invention. Claims 11-21 have been cancelled and the Applicants believe the rejection is now moot. Applicants request withdrawal of the rejection.

Claims 1, 5-6, 8, 10-12 and 16-18 stand rejected under 35 U.S.C. § 102(a) as being anticipated by WO99/47731 to *Chen*. The Examiner asserts that *Chen* discloses the aspects of the invention recited in claims 1, 5-6, 8, 10-12 and 16-18. Applicants respectfully respond to this rejection.

Chen discloses depositing an ultra-thin copper seed layer by a PVD process and then depositing a seed layer enhancement material by an electrochemical copper deposition process followed by blanket plating.

Chen does not teach, show, or suggest depositing an electrically conductive seed layer onto a substrate, immersing the substrate into a plating solution, and plating metal ions from the plating solution onto the substrate during the immersing process by applying a plating bias to the substrate at a charge density between about 20 mA*sec/cm² and about 160 mA*sec/cm², as recited in claim 22 and claims dependent therefrom. Withdrawal of the rejection is respectfully requested.

Chen does not teach, show, or suggest depositing a seed layer over the substrate surface and features, immersing the substrate surface and features into an electrochemical plating solution, and applying a plating bias at a charge density of between about 20 mA*sec/cm² and about 160 mA*sec/cm² during the immersing

process to deposit a first metal layer on the seed layer, as recited in claim 29 and claims dependent therefrom. Withdrawal of the rejection is respectfully requested.

Chen does not teach, show, or suggest a method for immersing a substrate into a plating solution, comprising immersing the substrate into the plating solution while simultaneously applying a charge density of between about 20 mA*sec/cm² and about 160 mA*sec/cm², as recited in claim 35 and claims dependent therefrom. Withdrawal of the rejection is respectfully requested.

Claims 1-4, 6-15, and 18-21 are rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,423,636 to *Dordi*. The Examiner asserts that *Dordi* discloses the aspects of the invention recited in claims 1, 5-6, 8, 10-12 and 16-18. Applicants respectfully respond to this rejection.

Dordi discloses depositing a full coverage seed layer over the substrate, electrochemically depositing a metal layer over the seed layer, and removing nay exposed seed layer from an annular edge portion of the substrate.

Dordi does not teach, show, or suggest depositing an electrically conductive seed layer onto a substrate, immersing the substrate into a plating solution, and plating metal ions from the plating solution onto the substrate during the immersing process by applying a plating bias to the substrate at a charge density between about 20 mA*sec/cm² and about 160 mA*sec/cm², as recited in claim 22 and claims dependent therefrom. Withdrawal of the rejection is respectfully requested.

Dordi does not teach, show, or suggest depositing a seed layer over the substrate surface and features, immersing the substrate surface and features into an electrochemical plating solution, and applying a plating bias at a charge density of between about 20 mA*sec/cm² and about 160 mA*sec/cm² during the immersing process to deposit a first metal layer on the seed layer, as recited in claim 29 and claims dependent therefrom. Withdrawal of the rejection is respectfully requested.

Dordi does not teach, show, or suggest a method for immersing a substrate into a plating solution, comprising immersing the substrate into the plating solution while simultaneously applying a charge density of between about 20 mA*sec/cm² and about 160 mA*sec/cm², as recited in claim 35 and claims dependent therefrom. Withdrawal of the rejection is respectfully requested.

Claims 11-14 and 16-17 are provisionally rejected under 35 U.S.C. § 101 as claiming the same invention as of copending Application No. 09/614,407. Applicants acknowledge the provisional rejection by the Examiner. Applicants have cancelled claims 1-21 without prejudice and submitted new claims 22-38. Applicants will file a terminal disclaimer if necessary when any provisional rejection is no longer provisional.

The secondary references made of record are noted. However, it is believed that the secondary references are no more pertinent to the Applicant's disclosure than the primary references cited in the office action. Therefore, Applicant believes that a detailed discussion of the secondary references is not necessary for a full and complete response to this office action.

In conclusion, the references cited by the Examiner, alone or in combination, do not teach, show, or suggest the methods of the invention as claimed. Having addressed all issues set out in the office action, Applicant respectfully submits that the claims are in condition for allowance and respectfully request that the claims be allowed.

Respectfully submitted,



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